

## STATEMENT OF OPINION

by

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**On: PhD Thesis for awarding the educational and scientific degree**  
**"Doctor"**

**Professional field:** 1.3. Pedagogy of training in...

**Doctoral program:** "Methodology of teaching in biology"

**Author of the PhD Thesis:** Nikola Stefanov Vakrilov

**Form of doctoral studies:** individual study plan

**Department:** "Botany and Biological Education" at the Faculty of Biology of "Paisii Hilendarski" University of Plovdiv

**Topic:** "Debate as a method of teaching biology in secondary school"

**Research supervisor:** Assoc. prof. Dr. Delka Karagyozeva-Dilkova, "Paisii Hilendarski" University of Plovdiv

The statement of opinion has been prepared on the basis of Order No. RD-21-1021/07.06.2022. of the Rector of "Paisii Hilendarski" University of Plovdiv to determine the members of the scientific jury for the procedure.

### **1. General presentation of the procedure and the doctoral student**

The presented set of materials on electronic media, related and proving the procedural validity of the procedure, have been prepared precisely and carefully. They fully comply with the Act on the Development of the Academic Staff in the Republic of Bulgaria, the Rules for its Implementation and the Regulations for the Development of the Academic Staff of "Paisii Hilendarski" University of Plovdiv.

Doctoral student Nikola Vakrilov has attached seven full-text publications on the topic of the PhD Thesis.

## **2. Brief biographical data for the doctoral student**

Nikola Stefanov Vakrilov was born in 1987. He was awarded a higher educational bachelor degree in Biology at the Faculty of Biology of the "Paisiy Hilendarski" University of Plovdiv in 2011, and a year later he also obtained a pedagogical qualification as a biology teacher and a teacher in the subject "Man and Nature". In 2013 completed a master's program in "Ecology and Systems Conservation" at the same university.

He started his professional activity in 2012 as a biology and health education teacher at the "Dr. Ivan Bogorov" Professional High School for Leather Products and Textiles. His teaching experience as a biology and health education teacher includes work in various schools in the city of Plovdiv and the region. At the moment, Nikolay Vakrilov is a teacher of Biology, Health Education, Man and Nature at "Petko Karavelov" Elementary School - Asenovgrad.

Doctoral student N. Vakrilov has been constantly improving his pedagogical qualification and personal skills. This is evidenced by his numerous participations in various practically oriented seminars and trainings.

## **3. Relevance of the topic and appropriateness of the set goals and tasks**

The presented PhD thesis is dedicated to an extremely topical problem related to the implementation of the debate as an interactive method in the teaching of biology, which acquires new theoretical and practical dimensions through the specific research.

The problem of teaching methods is one of the most important and at the same time one of the most complex issues of didactics and, in particular, the methodology of teaching biology. Training methods are one of the most dynamic and variable components of education, which are influenced by various factors and conditions, as well as continuous changes in training in general. At the same time, the effectiveness and quality of learning the content depends on the methods of study, which predetermines their permanent significance. In this sense, with his research, doctoral student N. Vakrilov contributes to the in-depth study of the debate as an effective method for mastering the teaching content in biology.

As the author points out, "...the need for experiential learning through debate in biological education is also of great importance due to the fact that its implementation requires the constant commitment of the participant, the constant search for common solutions and .... causes more and better quality interactions between the teacher and the students, as well as between the students themselves'. This brings out the need for in-depth study and analysis of the potential of the debate in order to confirm it as a method of learning in the secondary school, which is an emphasis of the present work and proves its relevance and significance.

## **4. Knowledge of the problem**

The author knows the literature on the topic very well and adequately evaluates and creatively uses the literary material. His theoretical reasoning is the result of a study of 130 sources, of

which 108 are in Cyrillic and 22 in Latin, with more than half of the literary sources being from the last 10 years. N. Vakrilov thoroughly, comprehensively and purposefully researches and analyzes the pedagogical and psychological aspects of using the Debate as an interactive method in teaching biology in secondary schools. He emphasizes the opportunities of the debate to use the personal experience of each participant in the study; to ensure an atmosphere of cooperation, respect for the opinion and free choice of the person in making a decision, and in general to assist in the full development of the person. The conducted study examines the motivation of 7th, 8th and 9th grade students as a result of the implementation of the Debate and reports the acquisition of cognitive taxonomies related to the goals in the cognitive domain of knowledge, understanding and analysis.

## **5. Research methodology**

Regarding the methodology of the research, the doctoral student has combined several basic research methods in the two stages of the pedagogical research – ascertaining and transforming experiments, both relevant to the goals and tasks set for solving. Mr. Nikola Vakrilov has created a system of criteria and indicators that allows an adequate verification of the effectiveness of the developed methodical model for holding educational debates in the teaching of Biology and Health Education. A survey card of 13 questions was developed, exploring the opinion of the students regarding the conducted biology lessons through the experimented learning debate model. Didactic tests were developed and tested to measure the degree of increase in students' competencies as a result of the application of the experimental model with educational debates. The stages and timing of the study are described in detail. The mathematical and statistical methods for processing and analyzing the collected data are correctly presented. The didactic experiment was conducted during two consecutive school years 2014/2015 and 2015/2016 among 685 students from the 7th, 8th and 9th grades in secondary schools on the territory of the cities: Plovdiv, Tsarevo, Primorsko and Malko Tarnovo.

The complex methodology proposed by the author allows the experimental work to be brought to a high scientific level.

## **6. Characterization and evaluation of the PhD thesis**

The PhD thesis is laid out in 286 standard pages and illustrated with 50 figures, 116 tables, 1 scheme and 3 appendices. Structurally, the thesis is composed of an introduction, three chapters, a conclusion and appendices.

In the **Introduction**, with exceptional persuasiveness, doctoral student Nikola Vakrilov sets the significance of the developed issue, motivates its choice and points out the problems that are clarified in the individual parts.

**The First chapter - "Theoretical statement of the problem"** in terms of content has a theoretical character and corresponds to a literature review. It is very well structured, with individual paragraphs clearly differentiated. An analysis of educational paradigms, learning

theories and motivation to achieve success in learning and life has been made. Emphasis is placed on the advantages of interactive learning methods and their role in the formation of key competencies. In an analytical plan, the potential of the debate as an interactive method in the teaching of biology are discussed. An analysis of the approaches and methods of teaching biology was made. The author pays special attention to debate as a method, historically and as an interactive method of learning. Doctoral student N. Vakrilov has studied authoritative sources related to the issue under consideration. They are quoted objectively and correctly. The literature review ends with a synthesized summary that confirms the relevance of the PhD thesis. The orientation of the theoretical formulation enables the empirical study to be built on a solid and scientifically presented theoretical base.

In Bulgaria, there is limited experience in researching the debate as a teaching method, and this requires the doctoral student to empirically verify the effectiveness of the debate applied in the preparation of students in biology and health education.

**In the Second chapter "Design and Methodology of Pedagogical Research"** in a logical plan subject to the theoretical study, the experimental program of the doctoral student is developed. In the presented thesis, the purpose, tasks, subject and object of research and the methodology are logically presented. The aim of the thesis is the development of a theoretically grounded, effective methodology for conducting educational debates and its experimental verification in general lessons in Biology and health education in the 7th, 8th and 9th grades. For the fulfillment of the set goal, seven tasks have been formulated, adequate to the goal and covering all aspects of the thesis.

The design, stages and timing of the study are described in detail. The developed system of criteria and indicators for checking the effectiveness of the methodological model, as well as a description of the model, is competently presented. Special attention has been paid by the author to the content aspect of the model, presenting all general topics structured according to the criteria and indicators. The methodology of the study is adequate and presupposes statistically justified conclusions.

**The Third chapter "Presentation and analysis of the obtained results"** represents the essence, the core of the PhD thesis. It is devoted to the analysis of the research results and their discussion. On the basis of the interpretive analysis, the author comes to the conclusion that the application of the interactive method "debate" contributed to analysis and generalizations, to making correct decisions, improved the ability to communicate, intelligence and adaptability of the students. This interactive approach contributes to the creation of positive motivation, to increase the cognitive interest of learners and increase their communication skills.

I would like to emphasize that what stands out in this chapter are the excellent skills of doctoral student Vakrilov for analysis and reasoned interpretations of empirical data. The visualization of the results after the statistical processing of the collected data leaves a good impression. This

makes the analysis and interpretation of the results more accessible and comparable to similar studies.

The thesis ends with the formulation of conclusions, which are a natural conclusion of the research, the obtained results and their interpretation.

The work is stylistically sound, written in very good language and at a modern scientific level.

The conducted studies, analyses, findings and the established interrelationships, as well as the accumulated professional experience, give the doctoral student Vakrilov the exceptional opportunity to develop a methodological model for debate, which has proven its effectiveness in the teaching process of biology. I believe that the introduction of this model in the teaching of biology will contribute to an increase in the motivation to learn and a better assimilation of the educational content in terms of depth and permanence.

## **7. Contributions and significance of the research for science and practice**

The formulated **contributions** are real and reflect the significance of the presented thesis. They can be outlined in three directions:

### **Theoretical-methodological contributions:**

1. The interactive methods and in particular the debate, as a method of teaching Biology in secondary school, have been thoroughly, comprehensively and purposefully studied.
2. Criteria and indicators have been developed and approved for adequate verification of the effectiveness of the methodical model for holding educational debates in the teaching of Biology and health education.
3. The methodology of teaching biology and health education in the 7th, 8th and 9th grade of secondary school is enriched with a developed methodical model for applying debate in general lessons, through which communication skills, natural science competence and competences related to learning skills and support for a healthy lifestyle and sustainable development are formed.

### **Scientific and applied contributions:**

1. Didactic tests have been developed and tested to measure the degree of increase in students' competencies as a result of the application of the experimental model with educational debates.

### **Practical contributions:**

1. An algorithm for constructing and holding a debate in general biology lessons in the 7th, 8th and 9th grades is described.

2. A methodical model for summative lessons with the application of debate as a teaching method has been approved, which leads both to a change in the students' attitudes towards learning and the learning environment.

3. A methodical basis has been created for the implementation of the developed methodical model for applying debate in summary lessons in real pedagogical practice by the teachers who teach biology and health education in the 7th, 8th and 9th grades.

The PhD thesis and its contributions are the result of the purposeful work and scientific research of doctoral student N. Vakrilov. The high professional competence and research culture allow him to achieve full correspondence between the theoretical-experimental setting of the thesis and the developed methodical model for holding a debate.

### **8. Evaluation of publications on the PhD thesis**

Seven full-text publications related to the issues of the thesis are presented. In all publications, the doctoral student is an independent author. The number and quality of the publications fully correspond to the internal requirements of "Paisiy Hilendarski" University of Plovdiv for public protection and to a large extent reflect the achieved results and the essence of the dissertation research.

### **9. Personal participation of the doctoral student**

The PhD thesis shows that the doctoral student Nikola Vakrilov has followed a successful path of research development, has gained experience in conducting scientific research and interpreting the obtained results. In this regard, I highly appreciate the personal participation of the doctoral student in the conducted thesis research and consider the formulated scientific contributions and obtained results to be significant and accurate. No plagiarism detected.

### **10. Abstract**

The abstract to the thesis is designed according to the requirements and in a synthesized form reflects the goals, tasks, methods used, results, conclusions and recommendations.

### **11. Critical remarks and recommendations**

I have no critical remarks and recommendations to the research conducted and a set of materials provided on the procedure.

In order to popularize the results of the research, I recommend to Nikola Vakrilov that he publish a monographic work dedicated to the issue under consideration. In support of the pedagogical practice in the teaching of biology, it would be good to issue a practical guide with the methodological developments of the general lessons in biology and health education in the 7th, 8th and 9th grades together with the tests to assess the achievements of the students.

## **CONCLUSION**

Nikola Vakrilov's PhD thesis is distinguished by a number of merits in theoretical and practical-applied terms. The author achieves his goal and presents convincing results in support of the research thesis.

I believe that he fully meets all the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the Implementation of ZRASRB and the Regulations of "Paisiy Hilendarski" University of Plovdiv.

The PhD thesis shows that Mr. Vakrilov has in-depth theoretical knowledge and professional skills in the scientific specialty "Methodology of teaching biology" and has demonstrated qualities and skills for independent conduct of scientific research.

The merits and qualities of the PhD thesis highlighted in the opinion are grounds for me to give my positive vote and to propose to the respected members of the Scientific Jury to award the educational and scientific degree "Doctor of Philosophy" to Nikola Stefanov Vakrilov in the field of higher education: 1. Pedagogical sciences, professional direction 1.3. Pedagogy of teaching in..., doctoral program "Methodology of teaching in biology".

28.08.2022.

Plovdiv

Professor Dr. Bianka Tornyova

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